Having thus described the preferred embodiment, the invention is now claimed to be:

1. A photolytic artificial lung for oxygenating blood comprising:

an inlet for receiving blood and transporting the blood to a photolytic cell;

a photolytic cell having a light activated catalyst, said light activated catalyst having the ability to convert water to oxygen upon light activation;

a light source for providing light photons to said photolytic cell and activating said catalyst; and

an outlet for transporting oxygenated blood out of said photolytic cell.

2. The photolytic artificial lung of claim 1, wherein said light activated catalyst is anatase (TiO_2).

3. The photolytic artificial lung of claim 1, wherein said light source is an ultraviolet laser light at 350-380 nm.

4. The photolytic artificial lung of claim 1, wherein said photolytic artificial lung further comprises a sensor monitoring reaction chemistry in said photolytic cell.

5. The photolytic artificial lung of claim 4, wherein said lung further comprises a processor regulating said photolytic cell in response to said sensor.

6. The photolytic artificial lung of claim 1, wherein said photolytic artificial lung further comprises a gas sorption device connected to said photolytic cell.

7. The photolytic artificial lung of claim 1, wherein said photolytic cell converts water to dissolved oxygen by a series of photochemically initiated reactions.

8. The photolytic artificial lung of claim 1, wherein said photolytic cell contains a second catalyst, MnO_2.

9. The photolytic artificial lung of claim 7, wherein said photolytic cell simultaneously produces dissolved oxygen from water and carbon dioxide from a bicarbonate ion present in the blood.

10. A photolytic artificial lung for producing oxygen and removing carbon dioxide from blood:

an inlet for receiving blood from a specimen and transporting the blood to a photolytic cell;

a photolytic cell having a light activated catalyst, said light activated catalyst having the ability to convert water to oxygen upon light activation;

a light source for providing light photons to said photolytic cell and activating said catalyst to initiate a series of chemical reactions that result in oxygen generation and carbon dioxide removal; and

an outlet for transporting oxygenated blood out of said photolytic cell.

11. The photolytic artificial lung of claim 10, wherein said light activated catalyst is anatase (TiO_2).

12. The photolytic artificial lung of claim 10, wherein said light source is an ultraviolet laser light at 350-380 nm.

13. The photolytic artificial lung of claim 10, wherein said photolytic artificial lung further comprises a sensor monitoring reaction chemistry in said photolytic cell.

14. The photolytic artificial lung of claim 10, wherein said lung further comprises a processor regulating said photolytic cell in response to said sensor.

15. The photolytic artificial lung of claim 10, wherein said photolytic cell converts water to dissolved oxygen by a series of photochemically initiated reactions.

16. The photolytic artificial lung of claim 10, wherein said photolytic artificial lung further comprises a gas sorption device.

17. The photolytic artificial lung of claim 10, wherein said photolytic cell contains a second catalyst, MnO_2.

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18. A photolytic cell comprising:
a transparent window;
an anode conductor layer adjacent to said transparent window;
a light-activated catalyst disposed upon said anode conductor layer;
a cathode connected to said anode; and
a catholyte bordering said cathode.

19. The photolytic cell of claim 18, wherein said light-activated catalyst is a metal oxide catalyst.

20. The photolytic cell of claim 18, wherein said metal oxide catalyst is selected from the group consisting of TiO_2 anatase, WO_3, and ZnO.

21. The photolytic cell of claim 18, wherein said cell further comprises a second catalyst disposed on said light-activated catalyst.

22. The photolytic cell of claim 21, wherein said second catalyst includes at least one of Fe^{II}, Fe^{III}, Cu^{I}, Cu^{II}, Co^{II}, Co^{III}, Mn^{II}, Mn^{III}, Mn^{IV}, and MnO_2.

23. The photolytic catalyst of claim 22, wherein said second catalyst is MnO_2.

24. The photolytic catalyst of claim 18, wherein said photolytic cell further comprises a cation exchange membrane abutting said catholyte.

25. The photolytic cell of claim 18, wherein said photolytic cell converts water into oxygen.

26. The photolytic cell of claim 18, wherein said light-activated catalyst converts water into active oxygen.

27. The photolytic cell of claim 21, wherein said second catalyst converts active oxygen to dissolved oxygen.

28. The photolytic cell of claim 18, wherein electrons flow from said anode to said cathode.

29. A gas sorption device comprising:

a coalescence compartment comprising a gas head space and a gas coelescor connected to said gas head space; and

a gas sorber connected to said coalescence compartment, wherein gas accumulating in said gas head space moves to said gas sorber, and said gas sorber converts gas to a solution or solid.

30. The gas sorption device of claim 29, wherein said gas sorption device further comprises an entry point connected to said gas head space for entry of hydrogen gas.

31. The gas sorption device of claim 29, wherein said coelesor further comprises an outlet connected to said coelesor for the removal of said solution.

32. A method for delivering oxygen to a solution comprising:

providing the solution into a photolytic cell;

converting water into dissolved oxygen by a light-activated catalyst in said photolytic cell;

binding said dissolved oxygen to said solution; and

removing said solution out of said photolytic cell.

33. The method of claim 32, wherein said solution is blood.

34. The method of claim 33, further comprising removing carbon dioxide from said solution in said photolytic cell.

35. The method of claim 32, further comprising producing carbon dioxide from said solution in said photolytic cell; and removing said carbon dioxide from said photolytic cell.

36. A method for oxygenating blood from a patient comprising the steps of:

providing blood from a patient into a photolytic cell;

converting water present in the blood into dissolved oxygen in said photolytic cell by a series of photochemical reactions;

binding the dissolved oxygen to blood hemoglobin;

forming carbon dioxide in said photolytic cell;

removing carbon dioxide formed in said photolytic cell and blood; and

removing oxygenated blood out of said photolytic cell and returning the blood to the patient.

37. A method for producing oxygen and removing carbon dioxide from a patient's blood comprising the steps of:

providing deoxygenated blood received from a patient into a photolytic cell, wherein said photolytic cell contains a light activated catalyst having the ability of converting water to oxygen upon light activation;

providing light to said photolytic cell and activating said catalyst wherein water present in the blood is converted into to dissolved oxygen and carbon dioxide is formed in said photolytic cell;

binding the dissolved oxygen to blood hemoglobin in said photolytic cell;

removing the carbon dioxide formed in said photolytic cell; and

removing the oxygenated blood out of said photolytic cell and returning the blood to the patient.